ARS Science Hall of Fame

September 8, 2016

30th

Agricultural Research Service
U.S. Department of Agriculture

A special website is available that features photographs and biographies of all ARS Science Hall of Fame inductees since the inaugural year of 1986. Special features include browse and search functions and video clips.

Please visit www.ars.usda.gov/careers/hof/

Agricultural Research Service
SCIENCE HALL OF FAME

The ARS Science Hall of Fame was inaugurated in 1986. We determined that each succeeding year, one or more present or former scientists with the Agricultural Research Service could be selected, subject to the following criteria:

The selectee made widely recognized impact on agricultural research by the solution of a significant agricultural problem through research.

The selectee is a person whose scientific accomplishments and stature continue to affect the agricultural research community and/or influence the development of science-based agricultural policy.

The selectee's character and record of achievement have brought major recognition and credibility to ARS and/or USDA, and are worthy of emulation by younger agricultural scientists.

The selectee's achievements must be or have been nationally and/or internationally recognized by peers in the scientific community.

Today we honor four outstanding scientists by inducting them into the Science Hall of Fame. A plaque citing the achievements of each will be added to the permanent exhibit in the George Washington Carver Center, Beltsville, MD.

Chavonda Jacobs-Young

Chavonda Jacobs-Young
Administrator

2016

Science Hall of Fame

Thomas J. Jackson

Research Hydrologist
Hydrology and Remote Sensing Laboratory
Beltsville, MD

For managing agricultural water resources through satellite remote sensing.

Water availability in soil is the single most limiting factor in crop productivity. Tracing that water within layers of earth and under ever-changing canopies of vegetation has been complex and challenging.

Research hydrologist Thomas J. Jackson's pioneering work to develop and adapt satellite-based microwave sensors opened the way to precise tracking of global soil moisture. He was the first scientist to develop a way to remove the effects of the vegetation layer from microwave remote sensing measurements, a milestone achievement.

Jackson's algorithms merging data from diverse parts of the electromagnetic spectrum are fundamental to research in this field today and are being used in satellite remote sensing projects of the European Space Agency, the Japanese Aerospace Applications Agency, and National Aeronautics and Space Administration (NASA)—nearly every country and group in space now to gather more detailed soil moisture data from large swaths of the world.

Benefits flowing from the foundation laid by Jackson's work include improved crop yield monitoring and forecasting, better famine early warning systems (particularly in sub-Saharan Africa and South Asia, where hunger remains a major human health factor), breakthroughs in hydrologic and climate modeling, and even identification of human, animal, and plant disease outbreaks driven by excess or deficit of soil moisture.

The breadth and depth of Jackson's contributions are reflected in his election as Fellow of four diverse scientific societies: the American Geophysical Union, American Meteorological Society, Institute of Electrical and Electronics Engineers, and Society of Photo-optical Instrumentation Engineers. Among his many other honors are a Presidential Rank Award (2012), ARS Distinguished Senior Scientist of the Year (2002), William T. Pecora Award (NASA and Department of the Interior, 2004), and IEEE Geoscience and Remote Sensing Society Highest Impact Paper Award (2015).

2016

SCIENCE HALL OF FAME

Cletus P. Kurtzman

Research Microbiologist
Mycotoxin Prevention and Applied Microbiology Research Unit
Peoria, IL

For groundbreaking research on the identification and utilization of microbes to advance agriculture, biotechnology, and medicine.

Cletus P. Kurtzman is world renowned for his pioneering development and use of molecular biology techniques to identify and describe microorganisms of agricultural, biotechnological, scientific, and medical importance. His research fundamentally changed the field of yeast taxonomy and gave rise to new, improved methods of studying the genetic diversity of these microorganisms and determining the relationships among species.

Kurtzman identified gene sequences enabling researchers worldwide to rapidly and accurately distinguish one yeast species from another. He led in the development of a comprehensive database and barcode-based system of sequence information to facilitate the diagnosis of all known yeasts species in the Ascomycetes fungal division. His genetic diversity research also ushered in better predictions on the biological properties of newly discovered yeast species.

Kurtzman's own discovery of yeasts capable of fermenting simple plant sugars is credited with reviving industry efforts to convert crop biomass materials, like corn bran, into ethanol fuel. Other discoveries include *Starmerella* yeast species that produce natural surfactants called "sophorolipids," which have potential use in detergents, cosmetics, paints, herbicides, and other products. Kurtzman's impact also extends to the clinical diagnosis of opportunistic yeast pathogens in humans and the commercialization of a beneficial species to biologically control Botrytis rot in stored grapes.

Kurtzman's leadership includes serving as an ARS research unit leader (1981-2010), mentoring young scientists, and overseeing the curation of the ARS Culture Collection, which numbers 100,000 microbial strains.

A prodigious scientific author and oft-invited lecturer, Kurtzman has received numerous awards and honors, including the Presidential Rank Award (2004) and a founding fellow appointment to the International Mycological Association in 2014. He is a member of the International Commission on Yeasts.

Joyce E. Loper

Research Plant Pathologist (Retired)
Horticultural Crops Research Unit
Corvallis, OR

For scientific leadership in understanding and application of biocontrol agents for control of plant diseases, for mentoring young scientists, and for service to ARS and the profession of plant pathology.

Research plant pathologist Joyce E. Loper is an international leader in the area of biocontrol of plant pathogens. She has brought recognition to ARS through her research, leadership, collaborative projects, engagement with professional societies, and participation in organizations that help set policy and research direction. Loper's research has been on the molecular basis of biological control and the genomics, siderophore production, and secondary metabolism of *Pseudomonas* spp.

Throughout her career, Loper has conducted pioneering research in rhizosphere ecology, biological control, mechanisms of disease suppression, bacterial plant diseases, and the genomics and molecular genetics of plant-associated bacteria.

As a Ph.D. student, Loper was the first to document that populations of rhizosphere bacteria were highly variable in the soil, which is now recognized as one of the major factors that lead to inconsistency in the effectiveness of biocontrol agents and has led to a change in how populations of biocontrol agents in the soil are quantified. As a result of her many studies on why biocontrol was inconsistent and her discoveries on antibiotic production, *Pseudomonas fluorescens* Pf-5 was the first biocontrol agent for plant diseases to be sequenced, which led to many new discoveries on the mechanisms of biocontrol.

Loper's research program has served as a magnet for graduate students, postdocs, and visiting scholars, domestic and international, who seek the opportunity to conduct research in biological control and bacterial genetics and genomics.

Loper was the ARS Distinguished Senior Research Scientist of the Year in 2014. She is a Fellow of the American Phytopathological Society and also of the American Association for the Advancement of Science.

2016
Science Hall of Fame

M. Susan Moran

Research Hydrologist (Retired)
Southwest Watershed Research Laboratory
Tucson, AZ

For innovative research to understand soil moisture and vegetation with remote sensing of irrigated cropland and rangeland, and for leadership in promoting interagency collaboration.

Research hydrologist M. Susan Moran has earned national and international recognition for her innovative research on remote sensing of soil moisture and vegetation on both irrigated cropland and rangeland, which now serves as a guide on how to improve water management across large areas.

During her exemplary 32-year career, Moran promoted interagency and international collaborations for watershed research, which included serving as Chair of the Soil Moisture Active Passive (SMAP) Applications Working Group. SMAP, a new satellite observatory launched in 2015 by the National Aeronautics and Space Administration (NASA), measures water in the top layer of soil everywhere on Earth.

Moran developed an "Early Adopter Program" that provided worldwide SMAP data users access to videos, tutorials, workshops, and simulated data. Early adopters used the data to develop applications for crop forecasting, drought monitoring, weather prediction, famine early warning, military maneuvering, and greenhouse gas estimation.

This one-of-a-kind program has since been implemented in every NASA Earth Observation mission. In addition, calibration methodology and equipment designed by Moran and colleagues have been adopted by scientists at the Foreign Agricultural Service, the European Space Agency, and commercial companies.

Moran's prestigious awards include ARS Outstanding Senior Research Scientist of the Year, the USDA Secretary's Honor Award, the Federal Laboratory Consortium Interagency Partnership Award, the Department of Interior Cooperative Conservation (Group) Award, and a Founder's Award for outstanding vision and leadership in establishing the Interagency Conferences on Research in the Watersheds. She is a Fellow of the American Association for the Advancement of Science and the American Society of Agronomy.

ARS Science Hall of Fame

1986

Edward F. Knipling

For pioneering research and leadership in development of the sterile insect technique, which led to the eradication of the screwworm, and of other technologies to suppress and manage insect pests.

1987

Howard L. Bachrach

For pioneering research on the molecular biology of foot-and-mouth disease that led to development of the world's first effective subunit vaccine for any disease of animals or humans through the use of gene splicing.

Myron K. Brakke

For consistent, career-long valuable contributions to the science of virology, particularly plant virology.

Glenn W. Burton

For outstanding achievements in forage and turf science, which have had extraordinary effects on the forage-based cattle industry, the turf industry, and agriculture worldwide.

Wilson A. Reeves

For outstanding research and leadership in the field of textile chemical finishing that have significantly benefited agriculture and consumers.

Earnest R. Sears

For pioneering work in wheat genetics and for discoveries on chromosomal mechanisms that established standards in animal, plant, and human genetics.

Orville A. Vogel

For development of the first useful semidwarf wheats and of innovative production systems that made the Pacific Northwest a major source of soft white wheat, inspired similar research efforts throughout the world, and sparked the Green Revolution.

Cecil H. Wadleigh

For elucidating the mechanisms through which crops respond to salinity and water stress and for inspired planning and leadership that enabled and motivated those who worked with him to expand and make use of knowledge of soils, water, and air and their interactions with plants.

1988

Francis E. Clark

For outstanding research leading to greater understanding of soil, plant, and microbial interactions and of nutrient cycling in terrestrial ecosystems.

Edgar E. Hartwig

For research in soybean breeding and genetics that has been a major factor in soybeans becoming the second most valuable U.S. crop and particularly for developing cultivars that thrive in the South.

Ralph E. Hodgson

For significant contributions to the knowledge of ruminant nutrition and for visionary leadership, both domestic and international, in the animal industries.

Hamish N. Munro

For career-long contributions to the science of nutrition, particularly on the relationship of dietary protein and iron to the health of the elderly, and for promotion of studies on aging.

Jose Vicent-Chandler

For research leading to new and greatly improved production systems for beef, milk, coffee, plantains, and rice for Puerto Rico and Caribbean countries.

1989

Douglas R. Dewey

For world leadership in genetics and taxonomy of the Triticeae tribe of grasses and for development of the cytogenetic basis for creating new grass hybrids.

Theodor O. Diener

For conceptualizing and discovering viroids, for leading research on viroid detection and control, and for inspiring new approaches in the search for causes of several serious diseases affecting plants, livestock, and humans.

Karl H. Norris

For developing principles and instruments using the electromagnetic wave spectrum to make rapid nondestructive measurements for evaluating quality of agricultural products.

John F. Sullivan

For engineering contributions to the food-processing and preservation industries, including development of instant potato flakes and of batch and continuous-explosion puffing.

1990

Theodore C. Byerly

For extraordinary contributions as a scientist, research leader, and administrator to the success of agricultural research programs and advances in U.S. and world agriculture.

Gordon Dickerson

For research contributions widely used by breeders to increase production efficiency of cattle, sheep, swine, and poultry.

Robert W. Holley

For isolation and characterization, including the first nucleotide sequence, of transfer ribonucleic acid (tRNA).

Virgil A. Johnson

For outstanding contributions to development of superior bread wheat cultivars and of improved wheat germplasm and for vigorous promotion of national and international cooperation among wheat breeders.

George F. Sprague

For outstanding contributions to effective methods of hybrid corn breeding and germplasm improvement.

1991

John H. Weinberger

For outstanding lifelong contributions in development of fruit varieties and fruit-breeding technology.

Walter H. Wischmeier

For developing the Universal Soil Loss Equation, which has been widely used for three decades worldwide in conservation and management of our natural resources.

1992

Raymond C. Bushland

For pioneering research leading to screwworm eradication by the sterile insect technique and for research leading to control of typhus vectors.

Lyman B. Crittenden

For significant contributions to retroviral genetics, transgenic animal development, and genome mapping in poultry.

Arnel R. Hallauer

For increasing understanding and use of quantitative genetics in plant breeding, which has led to development of many superior corn hybrids worldwide.

1993

John R. Gorham

For scientific leadership and studies that have resulted in solutions of disease control problems and have advanced the basic knowledge of viral and genetic diseases in humans and animals.

Sterling B. Hendricks

For significant contributions as a chemist, physicist, mathematician, plant physiologist, geologist, and mineralogist.

Clair E. Terrill

For scientific contributions and worldwide leadership in sheep production research.

1994

Charles N. Bollich

In recognition of superlative accomplishments in rice breeding and genetics and their consequent benefits to American agriculture.

Chester G. McWhorter

For outstanding contributions to American agriculture through basic and applied research that has resulted in improved weed-management technology, increased yields, and reduced cost of production.

Malcolm J. Thompson

For career research contributions in the field of insect and plant steroid biochemistry.

1995

Harry Alfred Borthwick

In recognition of contributions in elucidating the importance of photoperiodic mechanisms controlling flowering in plants.

William M. Doane

For initiating, leading, and conducting research that created new and useful products and led to the establishment of new industries based on agricultural raw materials.

Walter Mertz, M.D.
For contributions and leadership in elucidating the importance to health of several trace elements and promoting research on dietary risk factors for chronic disorders.

1996

Fred W. Blaisdell
For pioneering research and development of improved structures for soil and water conservation.

Herbert J. Dutton
For pioneering research leading to the establishment of soybean oil as the predominant edible vegetable oil in the world.

Charles Jackson Hearn
For developing improved orange, grapefruit, and tangerine varieties used extensively by U.S. citrus producers to replace trees killed by the 1980 freezes and to expand the citrus acreage.

1997

Morton Beroza
For major contributions to the development of environmentally compatible insect control strategies through discovery of lures, attractants, repellents, and pheromones.

R. James Cook
For extraordinary research on sustainable approaches to improve wheat health and for leadership in the transfer of information and technology resulting in solutions to agricultural problems.

William L. Ogren
For outstanding leadership and fundamental contributions to photosynthetic carbon metabolism leading to the discovery of new opportunities to improve the efficiency and productivity of crop plants.

1998

Thomas J. Henneberry
For conducting basic and applied individual and team research that has had sustained global impact on development and implementation of integrated pest management systems.

James H. Tumlinson III
For research that led to eradication of the boll weevil from the southeastern United States and the discovery of the chemical basis of plant-insect-parasite interaction.

1999

Allene R. Jeanes

For microbiological, chemical, and engineering research that created urgently needed, life-saving industrial polymers made from agricultural commodities.

Charles W. Stuber

For pioneering the use of molecular markers in identifying, mapping, and manipulating quantitative trait genes.

Richard L. Witter

For outstanding research contributions and leadership in the field of avian tumor viruses.

2000

Virginia H. Holsinger

For research leading to increased use of milk products and for humanitarian efforts in developing nutritious formulations for international food donation programs.

Marvin E. Jensen

For advancements in irrigation scheduling using computer models to estimate soil-water balance and for advancements in evapotranspiration theory.

Harley W. Moon

For contributions to a fundamental understanding of intestinal diseases in livestock and for development of effective control programs for these diseases.

2001

Lawrence A. Johnson

For pioneering research in developing the first useful technology for gender preselection of animal and human offspring and for outstanding contributions to semen preservation and artificial insemination in swine.

William E. Larson

In recognition of a pioneer who respected soil as a natural resource and devoted a research career toward improving its quality.

William L. Mengeling

For outstanding research contributions and leadership in the field of viral diseases of swine.

2002

George Inglett

In recognition of the development of novel, patented food ingredients including Oatrim and Nutrim, which have had a sustained beneficial effect on the American diet.

K. Darwin Murrell

For landmark research on parasites of veterinary and medical importance, especially trichinellosis of swine, and innovative development and leadership of laboratory and agency-level programs that established and advanced objectives of the Agricultural Research Service.

Stuart O. Nelson

For pioneering research on the dielectric properties of agricultural materials, applications of radio-frequency and microwave energy, and electrical measurements for moisture sensing in cereal grains.

2003

Edward B. Bagley

For outstanding research in rheology and food science that generated fundamental understanding of flow mechanics; and for pioneering concepts in super-absorbent materials that resulted in one of the most successful technology transfers in USDA history.

Janice M. Miller

For pioneering research in understanding, diagnosing, and controlling bovine leukemia, transmissible spongiform encephalopathies, and other chronic infectious or zoonotic diseases of ruminants.

2004

Donald K. Barnes

For remarkable contributions to alfalfa breeding and genetics, mentoring of plant breeding students, and service to ARS and the scientific community.

Ruth Rogan Benerito

For applying physical chemistry to solve problems that led to improved procedures and new uses for renewable resources such as cotton, wood, and paper.

Keith E. Gregory

For outstanding research contributions in genetics and breeding of beef cattle and for leadership of ARS research programs.

2005

Charles W. Beard

For outstanding contributions in poultry health research, in professional and organizational leadership, and in developing biocontainment concepts and systems for animal agriculture.

Nelson A. Cox

For lifetime contributions of distinctive research benefitting the poultry industry and public health through development and transfer of technologies that reduced foodborne pathogens, particularly Salmonella and Campylobacter.

Sigmund Schwimmer

For a distinguished career of scientific excellence in enzymology and its application to food science and human food products and quality.

Tien C. Tso

For outstanding research contributions and leadership in plant physiology and phytochemistry and their use to advance plant science.

2006

Wayne W. Hanna

For significant scientific contributions to U.S. food production and the national recreation industries and for related scientific achievements for research on apomixis and interspecific germplasm transfer.

Ray D. Jackson

For elucidating the basis of soil-plant-water-atmosphere relationships and developing innovative methods to assess and manage crop status through remote sensing.

Vernon G. Pursel

For lifetime contributions to genetic and reproductive development of livestock through pioneering research in genetic engineering and semen preservation.

2007

Johnie N. Jenkins

For pioneering leadership, vision, innovative cotton host plant resistance research and technologies, impact on science, and development and mentoring of young scientists.

Dennis Gonsalves

For pioneering research and leadership in plant pathology and biotechnology to increase agricultural productivity and improve human health.

Janet C. King
For national and international leadership and research achievement in human nutrition.

2008

Robert E. Davis
For meritorious and exemplary contributions to the science of plant pathology and for a dedicated career of service to the Agricultural Research Service.

Andrew N. Sharpley
For pioneering nutrient research leading to the development of agricultural management practices and strategies that are used nationally and internationally to protect water quality.

2009

Max J. Paape
In recognition of exceptional research and leadership that enhanced animal and human health through advances in the identification, control, and prevention of bovine mastitis.

J. Neil Rutger
For demonstrating the usefulness of induction, evaluation, and integration of mutants in rice genetics and breeding.

B.A. Stewart
For exceptional research on soil and crop management practices and outstanding leadership of local, national, and international research programs to sustain our natural resources.

2010

Jitender P. Dubey
For pioneering research in identifying and aiding in the control of protozoan diseases in livestock and humans.

Ronald L. Horst
For research on calcium and vitamin D metabolism resulting in strategies to prevent milk fever in dairy cows and for insight into bone disease.

L. Dale Van Vleck
For extraordinary contributions in expanding quantitative genetic and statistical theory and in developing computational procedures that had an impact in genetic improvement programs for livestock worldwide.

2011

Allen R. Dedrick

For national and international impact and leadership in the development and application of technology for efficient use of scarce water resources worldwide.

Ronald Fayer

For scientific leadership of research on parasites of veterinary and medical importance especially protist pathogens affecting food animals and food safety and for leadership of laboratory and agency programs that promoted the objectives of the Agricultural Research Service.

Ronald F. Follett

For outstanding research contributions in the enhancement of soil, water, and air quality.

2012

Larry V. Cundiff

For extraordinary research and outreach contributions having worldwide impact on genetic improvement programs, choice of breeds, and use of crossbreeding systems for beef production.

Donald P. Knowles

For innovative scientific leadership and research to solve serious problems in infectious animal diseases, creation of sustained partnerships, and training of future agricultural scientists.

Kenneth P. Vogel

For contributions to science, perennial grass breeding and genetics, and grassland and bioenergy production systems.

2013

Rufus L. Chaney

For internationally recognized research and applications of science leading to concepts, management, and regulatory actions reducing risks to human health and environmental quality.

Sarah Hake

For pioneering research and leadership in developmental biology leading to the discovery and elucidation of genes that regulate plant architecture and agricultural productivity.

David W. Ramming

For pioneering research and leadership in the development of superior table grape, raisin, and stone fruit cultivars responsible for U.S. industry growth and consumer satisfaction.

2014

Perry B. Cregan

For pioneering research in developing genetic tools, widely used to improve legumes and grains worldwide, that are helping feed a hungry world.

Jerry L. Hatfield

For leadership and creativity in building the scientific foundation for agricultural practices leading to improved efficiency and reduced environmental impact of agricultural systems.

Hyun S. Lillehoj

For a lifetime of distinctive agricultural research impact, mentoring, and transfer of technologies that have benefited small and large poultry producers worldwide and contributed to global food security.

Ross Welch

For being a world leader on pioneering work linking agricultural research to human nutrition and health with a focus on micronutrient malnutrition in developing countries.

2015

Leon V. Kochian

For internationally recognized pioneering work using molecular biology, genetics, and plant breeding to improve crop yields on marginal soils in developing countries.

Donald R. Ort

For outstanding leadership, vision, and productivity in advancing research in the global climate change impacts on photosynthesis and crop production.

Ralph Scorza

For pioneering the integration of biotechnological and traditional breeding for the development of new tree fruit cultivars with novel tree architectures and fruit traits.

Scott R. Yates

For exceptional research, leadership, and technology transfer reducing the adverse environmental impacts from soil fumigation while maintaining pest control efficacy.